

FREQUENCY MEASURING DEVICE, POLISHING DEVICE
USING THE SAME AND EDDY CURRENT SENSOR

ABSTRACT OF THE DISCLOSURE

Disclosed is a frequency measuring device capable of
5 accurately detecting an end point of polishing a
semiconductor wafer by obtaining a frequency measurement
result highly accurately in a short period of time. A
device FC for measuring the frequency of a measured signal.
Vin comprises a counting section including a number i (i 2)
10 of n-nary counters 1 - i, a time reference circuit 13 which
outputs a time reference signal T, whose duration is t,
every time interval p, and a number I of gate circuits G1
to Gi whose outputs are connected to the inputs of the
n-nary counters 1 - i. The gate circuits receive the
15 measured signal Vin at a first input and receive the time
reference signal T at time intervals p at a second input.
With this structure, the counting section supplies the
frequency measured result of the measured signal Vin every
time interval p.

Further, the present invention provides an eddy
current sensor capable of stable operation is provided for
accurately detecting a polishing end point. The eddy
current sensor detects the thickness of a conductive film
from a change in an eddy current loss generated in the
25 conductive film. The eddy current sensor comprises a
sensor coil for generating an eddy current in the
conductive film, and an active element unit connected to
the sensor coil for oscillating a variable frequency
corresponding to the eddy current loss. The sensor coil
30 and active element unit are integrated to form the eddy
current sensor. Alternatively, the eddy current sensor
comprises a sensor coil for generating an eddy current in
the conductive film, and a detector for detecting a change
in the thickness of the conductive film from a change in a
35 resistance component (R) in an impedance formed by the
sensor coil and conductive film.